

## SPASM OF THE CILIARY MUSCLES OF CENTRAL ORIGIN.\*

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THE case upon which this paper is based presents the rare occurrence of a contracture of the ciliary muscles apparently in consequence of brain disease. Ciliary spasm is a common complaint in ophthalmic practice, but in the instances ordinarily observed the spasm arises from some condition in the eye. The exaggeration of a true myopia and the simulation of shortsightedness in a really hypermetropic or astigmatic eye by reason of such spasm, are everyday occurrences. But in these instances we cannot usually speak of a contracture of the ciliary muscle, for the spasm persists only while the eye is adjusted for some visual object. When the patient is examined ophthalmoscopically in a dark room, it is easy to measure the true refraction. The ciliary muscle relaxes nearly completely under these circumstances, and the refraction thus determined is found nearly the same as after paralysis of accommodation by means of atropia. I add the word nearly, because a slight normal tonus of the non-atropinized muscle is undeniable. Instances of ciliary spasm so persistent as to stimulate myopia even on ophthalmoscopic examination are much less common. In fact, such an occurrence as a complication in the ordinary anomalies of refraction is wholly denied by some

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authors of experience. I have likewise never seen an instance of it. A true and persistent spasm of the ciliary muscle from other causes has only been reported a few times. It was generally due to some trauma, abrasion of the cornea, or contusion of the eyeball. A few cases are reported as accompanying facial neuralgia and blepharospasm. Most instances of which I could find mention in ophthalmic literature were confined to one eye. But as far as I have been able to learn no instance of apparent myopia suddenly beginning in consequence of a brain lesion has yet been reported. The patient in whom I observed this unique state of affairs is a lady 23 years of age, who was referred to me, through the kindness of Dr. Jewell, for the ophthalmic features of the case.

The patient, previously in good health, had a very protracted labor during five days in March, 1880. Two days before the birth of a healthy child she was attacked with left hemiplegia while sitting in her chair. She had had no premonitory symptoms; she did not lose consciousness and did not complain of headache, but was simply faint and confused in her mind. Her speech was heavy for some days. The paralysis extended to the entire left side, but the face soon recovered from it, while the limbs improved in power more slowly. At no time was there any involvement of sensory nerves. The only interference with any of the involuntary functions consisted in transitory paralysis of the bladder, necessitating the temporary use of the catheter. In the following October, when she was examined by Dr. Jewell and later by myself, there remained only a paresis of the left arm, with complete paralysis of the extensor muscles. The hand was flexed but no contracture existed. According to Dr. Jewell's notes the patellar tendon-reflex was considerably exaggerated on the left side and rather energetic in the right knee. The patient was,

moreover, neurasthenic. The treatment consisted in the use of the induced current with massage of the paretic limb. Strychnia was given and attention paid to the neurasthenic complaints. There has been, however, but little improvement in the control of the muscles involved. The extensors are still wholly paralyzed.

This history points clearly to hemorrhage in the region of the right internal capsule. The actual destruction of nerve tissue was probably quite limited, and the involvement of the entire half of the body due to compression of the surrounding strands, or inhibition. But this anatomical diagnosis fails to explain the peculiar ophthalmic symptoms observed.

The patient claims to have always enjoyed perfect vision. In the fall previous to the accident she suffered of occipital headache for a few weeks, during which time her pupils were unusually wide, but there was no disturbance of sight. After the occurrence of the apoplexy she noticed a decided blurring of sight, especially on looking at a distant clock. She cannot now state exactly how soon her attention was directed to it after the apoplexy. This haziness of sight had not changed when I first saw her in October. At first she could not read at all, later on only with difficulty. At the examination I found her sight about one-tenth of the normal acuity. She accepted a concave glass of 1.75 dioptrics for the right eye, and 2.25 for the left eye. On account of the late hour and the approaching darkness, the examination was not quite satisfactory. She read the finest print, but only at a distance of 5" to 7", and with the above concave glasses at 8" to 12". Objectively the eyes presented no evidence of disease. The pupils were of normal size and mobility. The ophthalmoscope showed a normal fundus, a deep central excavation of the papillæ, which were well reddened, but not abnormally so. In the left eye the edges

of the disc were not sharp, while in the right eye there existed a small conus. Ophthalmoscopically, the myopia was measured to be 1.5 dioptics in each eye.

The history caused me to suspect the spasmodic origin of the myopia, but the patient, when assured that there was no immediate danger, was anxious to return home to a distant city. Hence, a further examination was postponed until the middle of November.

On her return, at this date, the following notes were taken :

*R. E.*  $V = \frac{20}{80}$  with  $-1.5$  D— $V = \frac{20}{80}$ .

*L. E.*  $V = \frac{20}{80}$  with  $-1.5$  D— $V = \frac{20}{80}$ .

Her near-point is 5" from the eye, but Sn 1.25 is not read any further off than 12". There exists no anomaly of the ocular muscles. Tested with prisms, they are found to be of full strength. Examination of the visual field and color-perception showed no anomaly. Ophthalmoscopically, no change was noted; it still required a correcting-glass of 1.5 D concave to see the disc and central part of the retina clearly.

That the myopia was not an anomaly of refraction, but one of accommodation, was distinctly suggested by the inability to read at a proper distance. A myope, requiring a glass of 24" focus and possessing a nearly normal visual acuity, can read not too fine a type at a distance of 24 inches. This patient, however, evidently exerted her accommodation unduly when converging for an object at that distance. It was one of those rare cases in which the accommodative apparatus did not act in harmony with the internal recti muscles. Every thing beyond 12" distance was seen indistinctly, although with parallel visual axes the apparent myopia was corrected by a glass of 24" focus. I could trace the inability to read beyond 12" distance to such an accommodative effort, greater than proportionate to the converg-

ence, in two ways. With concave glasses, correcting the myopia, apparent when the visual axes were parallel, she could not read at a much greater distance than without them, while I could increase her reading distance up to 16" by means of weak prisms, with the bases turned inward so as to diminish the contraction of the internal recti muscles. Such abducting prisms, however, did not diminish her myopia for the distance.

The nature of the shortsightedness was at once revealed by a thorough application of atropia. She returned to the office delighted with her normal sight. On testing I found  $V = \frac{20}{30}$  without glasses, while the addition of a convex glass of 0.5 D, in front of the right eye, gave her about the full sight possible to a strongly atropinized normal eye. The left eye was perfectly emmetropic.

The entire trouble, hence, consisted in a symmetrical, tonic, uninterrupted contraction of the ciliary muscle, increasing the refraction of the eye by 1.5 dioptrics. On converging for near objects this spasm evidently increased, until at a distance of 12" the accommodative and converging efforts became about proportionate. The strength of the ciliary muscle had not suffered, since the patient's near-point (5") corresponded to the usual figure of emmetropic eye at that age. This permanent contracture had not given rise to any unpleasant sensations. Since no other cause could be accused, and the spasm occurred suddenly within a very short time after the apoplectic attack, it is fair to consider it a consequence of the latter. In what manner, however, a lesion in or near the internal capsule can keep up a tonic but feeble activity of the ciliary branches of the motor oculi, cannot be decided. It is certainly noteworthy that notwithstanding the close anatomical relationship of the nerves of the iris and of the ciliary body there existed no pupillary anomaly.

As soon as the effect of atropia ceased, the former trouble returned. I advised her by letter to continue the application in a more dilute form. By trial she learned that a solution of one part of atropia in 3,500 parts of water removed the spasm completely, without enfeebling the accommodation sufficiently to interfere with reading. With this application she saw well, both in the distance and near by, while the inconvenience occasioned by the dilated pupils could be avoided by the use of smoked glasses. One drop of this solution every three days sufficed to keep her eyes in a satisfactory condition. She returned in March, at which date I found the former trouble unchanged, since she had not used the atropia for some weeks. At that time she called my attention to a peculiarity she had lately discovered. Her vision increased at once in distinctness on turning the head sideways, while retaining the eyes in their original direction. By trial with glasses I could not well decide, whether the myopia really diminished on exerting thus the external rectus of one, and the internal rectus of the other eye. At any rate, her visual acuity rose by this manoeuvre from  $\frac{20}{60}$  to  $\frac{20}{30}$  as tested with Snellen's plates. Since she was anxious to return home, I was limited in the choice of my remedies. Explaining to the husband the questionable efficacy, I have still had him make a number of metallo-therapeutic attempts, by applying various metallic discs to the temples as well as magnets to the nape of the neck. The intelligent patient tested herself carefully during these experiments with type at different distances and found no influence whatever. She has now returned to the use of the dilute atropia solution. The only remedial procedure of which I could find a promising record in ophthalmic literature is the hypodermic injection of strychnia, with which Nagel has succeeded admirably in a case of one-sided ciliary spasm.